

Association of Adverse Childhood Experiences and Perceived Autonomy Support with Diabetes-
Related Distress among Adults with Diabetes Mellitus and Depressive Symptoms

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ABSTRACT

Purpose and Background/Significance: Diabetes is increasing rapidly in the U.S. and affects over one-third of the adult population. Depression, diabetes-related distress, and adverse early life events are associated with impaired diabetes self-management behaviors and poorer glycemic control. Research guided by Self-Determination Theory shows that higher perceived autonomy support is associated with better diabetes health outcomes. The purpose of this analysis was to test a model of the relationships among perceived autonomy support, adverse childhood experiences, and depressive symptoms as predictors of diabetes-related distress in a sample of adults (N=45) with type 2 diabetes mellitus and depressive symptoms who were participating in a randomized pilot study of a 12-week patient-centered decision support intervention for depressive symptoms.

Methods: Baseline (pre-intervention) data were analyzed for standardized measures that included the Diabetes Distress Scale (DDS), Adverse Childhood Experiences Questionnaire (ACE), Patient Health Questionnaire-9 (PHQ-9) depression screening measure, and the Important Other Climate Questionnaire (IOCQ) measure of perceived autonomy support. Multivariate regression analysis was used to model the relationships among variables, using DDS as the dependent variable, and ACE and IOCQ scores as independent variables, after initially controlling for PHQ-9 score, sociodemographic and clinical characteristics.

Results: Hypotheses about the direction and significance of associations between IOCQ, ACE, and DDS were supported; i.e., IOCQ and DDS were negatively correlated ($r = -.364$, $p = 0.02$), ACE and DDS were positively correlated ($r = 0.46$, $p = .006$), and IOCQ and ACE were negatively correlated ($r = -.36$, $p = .05$). The study model accounted for 48.9% of the variance in DDS.

Conclusion: This study contributes to the theoretical understanding of how adverse childhood experiences and perceived autonomy support may influence diabetes-related distress. This knowledge can inform improved health care interventions to reduce diabetes-related distress to lead to improved diabetes outcomes.

BACKGROUND

According to the Centers for Disease Control and Prevention [CDCP] statistics, diabetes affects approximately 25.8 million people or 8.3% of the U.S. population (2011). Diabetes has increased at an unexpectedly rapid rate and has already exceeded the predicted values from 2001 of 20 million individuals with diabetes by 2025 (Boyle, J.P., et al.). A disproportionate number of individuals of lower socioeconomic status make up the diabetic population. The risk of developing diabetes has been found to increase by roughly 80% from the lowest to highest educated individuals (Everson, S.A., et al., 2002). The total cost of diabetes in the U.S. was estimated at \$174 billion dollars for 2007 (CDC, 2011). Diabetes has been linked to many health problems including heart disease, nephropathy, neuropathy, retinopathy, amputations, stroke, and depression.

There is a need to better understand potentially modifiable factors associated with diabetes-related outcomes as a basis for interventions to improve outcomes. Beyond education level, multiple other variables have been identified as correlates of diabetes outcomes, including depression, diabetes-related distress, and adverse early life events. Some psychological variables have been identified as correlates of diabetes outcomes, including perceived autonomy support (Williams, G. C., et al., 1998, Williams, G. C., et al., 2006). There is a need for additional research that can contribute to the theoretical understanding of how these factors relate to various diabetes-related outcomes. The overall goal of this thesis is to test a model of relationships among selected variables that may be predictive of diabetes-related distress in adults.

LITERATURE REVIEW

Depression and Diabetes

Individuals with diabetes have higher rates of clinically significant depression and

anxiety disorders compared to those without diabetes. There are even higher rates of depressive symptoms (not necessarily meeting criteria for major depression) and diabetes distress compared to major affective and anxiety disorders in individuals with diabetes (Fisher, L., et al., 2008).

Depression is a syndrome characterized by at least two episodes of depressed mood and/or loss of interest or pleasure in nearly all activities for at least two weeks with symptoms that cause a clinically significant impairment in social, work, or other important areas of functioning almost every day (DSM-IV-TR, 2000). Depression has a bidirectional association with diabetes mellitus and is associated with a risk of poorer glycemic control, medication adherence, quality of life, physical activity, and blood pressure control (Mathew, C.S., 2012).

Diabetes-related Distress

Diabetes-related distress is approximately twice as prevalent as depression in populations with diabetes, and is more persistent over time than depression and depressive symptoms (Fisher, L., et al., 2010). Diabetes-related distress is the emotional burden that an individual experiences from increased demands associated with diabetes care management (Polonsky, W.H., et al., 2005). Diabetes-related distress has been associated with poor diabetes self-management and glycemic control (Zulman, D.M., et al., 2012). Studies have shown that a high HbA1c level (a longer-term biomarker of diabetes control) has been associated with a persistence of depressive affect and diabetes distress over time (Fisher, L., et al., 2008), and that only diabetes-related distress has been associated with HbA1c (Fisher, L., et al., 2010). In a study where depression was controlled for, the effect of diabetes-related distress on perceived diabetes status remained virtually unchanged, which supports that diabetes-related distress exerts an independent effect on perceived diabetes status (Zulman, D.M., et al., 2012).

Adverse Childhood Experiences as Predictors of Health Outcomes

Adverse childhood experiences include psychological, physical, and sexual abuse as well as exposure to mental illness, substance abuse, violent treatment of a mother or stepmother, or criminal behavior before the age of 18 years old. Studies have reported 50% and 59% of their samples respectively have experienced at least one adverse event (Rosenberg, S.D., et al., 2007; CDC, 2010). Adverse childhood experiences are risk factors for psychiatric, substance abuse, health, and social functioning problems (Rosenberg, S.D., et al., 2007). As the exposure to adverse childhood experiences increases, the number of age-related disease risks in adult life becomes greater (Danese, A., et al., 2009). Diabetes prevalence has also been shown to increase with the exposure to adverse childhood experiences. For those individuals without reported exposure, 4.3% had been diagnosed with diabetes. At four or more adverse childhood experiences, the prevalence of diabetes increased to 5.8% of individuals (Felitti, V., et al., 1998). In a number of studies using the Adverse Childhood Experiences (ACE) questionnaire, higher scores have been shown to be associated with a higher incidence of diabetes.

Perceived Autonomy Support and Self-Determination Theory

Autonomy support includes the degree of conflict as well as intimacy in close relationships, the sense that one is or is not embedded in a supportive, caring social network, and the extent which one feels as tangible support from loved ones (Polonsky, W.H., 2002). Perceived autonomy support is associated with multiple types of health benefits (Gayman, M.D., et al., 2011). For example, high autonomy support has been linked with positive life events, high self-esteem, and an optimistic view of life; conversely, low autonomy support is associated with dissatisfaction with life and difficulty continuing on a task that does not yield a quick solution (Sarason, I.G., et al., 1983). The observations that individuals with low autonomy support may be more challenged by tasks that do not have a quick solution can contribute to the explanations

for elevated diabetes-related distress in individuals with low autonomy support.

The Self-determination Theory (SDT) considers the extent to which significant others in a person's social context are supportive of an individual's autonomy. SDT proposes that a person will develop and maintain more autonomous motivation to the extent that significant others are autonomy supportive (Williams, G.C., Freedman, Z.R., & Deci, E.L., 1998). In observational studies, autonomous motivation has been correlated with increased medication adherence, less depression, better diet, improved quality of life, and improved cholesterol and HgbA1c levels among individuals with diabetes type 2 (Juul, L., et al., 2011; Williams, G.C., et al., 2006; Williams, G.C., et al., 2007).

Summary and Purpose

After an extensive literature review, no research studies were located that have explored a correlation between adverse childhood experiences, social support, and diabetes-related distress. Many studies have explored linkages between two of these variables, but not all three in conjunction. Therefore, the purpose of this thesis is to use multivariate linear regression modeling to test a model of relationships among perceived autonomy support, frequency of adverse childhood experiences, and level of depressive symptoms as predictors of diabetes-related distress in a sample of adults with T2DM and depressive symptoms. This analysis controls for variables of secondary interest (sociodemographic, clinical, and depressive symptom variables), to examine the adjusted effects of adverse childhood experiences and autonomy support as predictors of diabetes-related distress. It is hypothesized, after controlling for sociodemographic characteristics (education level, age, race, and gender), clinical characteristics (HbA1c and number of health conditions), and level of depressive symptoms, that:

1. Higher ACE (Adverse Childhood Experiences Questionnaire) scores will be associated with lower perceived autonomy support.
2. Higher perceived autonomy support will be associated with lower diabetes-related distress.
3. Higher ACE scores will be associated with higher perceived diabetes-related distress.

Theoretical Model

The theoretical model guiding this research is presented in **Figure 1**. The theoretical model illustrates the relationships between Adverse Childhood Experiences, perceived autonomy support measured by the Important Other Climate Questionnaire, depressive symptoms measured by the PHQ-9, and the dependent variable of diabetes-related distress. Hypothesized relationships are indicated by arrows with “+” for positive relationships and “-“ for negative relationships. The primary variables of interest are represented as diabetes-related distress, perceived autonomy support, and adverse childhood experiences. Depressive symptoms are indicated in the figure as a secondary variable of interest with the dotted line. Other secondary variables that are not represented in the model include sociodemographic and clinical characteristics. All of the secondary variables were controlled for in the analysis.

METHODS

Primary Study Design

This correlational descriptive study uses a secondary analysis of data collected from an experimental study, in which the primary study aim was to pilot test a novel patient decision support intervention (DSI) with a shared decision making component, to improve decision-making about mild-moderate depression among adults with Type 2 diabetes and mild to moderate depressive symptoms (Wills, C.E., et al., 2012). Participants were randomly assigned to an intervention group utilizing the DSI with usual health care or control group with usual health care. The DSI was implemented during the first 12 weeks of the study. Data were

collected at five time points: baseline, 2 weeks, 6 weeks, 12 weeks, and 24 weeks during in person, on site interviews at weeks 0, 12, and 24 and by telephone at weeks 2 and 6 (Wills, C.E., et al., 2012).

Participants

In the primary study, convenience sampling was used to recruit 45 adults from 21 to 70 years of age. Participants completed a two-stage screening process to ensure that only participants meeting the inclusion criteria were enrolled (Wills, C.E., et al., 2012).

Inclusion and Exclusion Criteria

The inclusion criteria for this study were: (1) age 21 to 70 years; (2) diagnosed with Type 2 diabetes; (3) initial depression screening score of mild to moderate level depression, as indicated by a Patient Health Questionnaire-9 (PHQ-9) depression score between ≥ 5 and ≤ 19 and being bothered by one or more of the reported symptoms; (4) willing and able to complete required forms and procedures for study participation; and, (5) access to telephone and transportation to OSU for study sessions.

Study exclusion criteria were: (1) age < 21 or > 70 years old; (2) PHQ-9 score or < 5 or > 19 ; (3) history of alcoholism or other substance abuse that has required treatment; (4) currently receiving mental health specialty care from a psychiatric or other specialist (does not include counseling); (5) screening positive for, or taking medication for psychosis or bipolar disorder; (6) any cognitive problem affecting comprehension or ability to provide informed consent; (7) severe physical pain; (8) past or present history of suicidal/ homicidal ideation/ plans or attempts; (9) history of psychiatric hospitalization or rehabilitation; (10) current enrollment in another intervention study for improving psychological health; (11) inability or unwillingness to

complete required forms and procedures for study participation; and, (12) lack of access to telephone or transportation to OSU for study sessions (Wills, C.E., et al., 2012).

External and Internal Validity

External validity was addressed by obtaining a representative sample of the adult age population in central Ohio that is living with diabetes and experiencing mild to moderate depressive symptoms. The experimental design and standardized procedures of the primary study, including random assignment to intervention and usual care study groups, minimized threats to internal validity. A stratified randomized block design was used in which gender (male, female) and level of depressive symptoms (mild, moderate) were used as strata, resulting in equivalent proportions of both genders and level of depressive symptom severity for the intervention and usual care groups. The findings of the secondary analysis for this thesis will be potentially generalizable to (externally valid for) similar populations of adults who have type 2 diabetes and mild-moderate depressive symptoms.

Measures

All standardized measures included in the primary study have been used in prior research with adults with diabetes and depression and have known psychometrics. An overview of the measures in the secondary analysis is included below:

Diabetes Distress Scale

The Diabetes Distress Scale (DDS) was developed to assess diabetes-related emotional distress based on four distress-related domains: emotional burden subscale, physician-related distress subscale, regimen-related distress subscale, and diabetes-related interpersonal distress (Polonsky, W.H., et al., 2005). Example statements for each of the four distress-related domains are as follows: emotional burden subscale, “feeling overwhelmed by the demands of living with

diabetes”; physician-related distress subscale, “feeling that my doctor doesn’t take my concerns seriously enough”; regiment-related distress subscale, “feeling that I am not sticking closely enough to a good meal plan”; and diabetes-related interpersonal distress, “feeling that my friends/family don’t appreciate how difficult living with diabetes can be” (Polonsky, W.H., et al., 2005). Cronbach’s α for the total 17-item scale has been documented at $\alpha=0.93$, which indicates high internal consistency. Pearson correlation coefficients have been examined to demonstrate validity; i.e., elevated DDS total scores were associated with a younger age, greater depression, insulin use, poorer self-care, and having elevated lipid levels (Polonsky, W.H., et al., 2005).

Adverse Childhood Experiences

The Adverse Childhood Experiences (ACE) questionnaire was designed to quantify the occurrence of adverse experiences an individual experienced before the age of 18 years. Questions assess psychological, physical abuse, or contact sexual abuse as well as exposure to mental illness, substance abuse, violent treatment of their mother or stepmother, or criminal behavior. Frequency of adverse childhood experiences (total ACE score) has been shown to be associated with psychological distress, impaired health management, and poor health outcomes, including increased risk of diabetes (CDCP, 2010; Danese et al., 2009).

Important Other Climate Questionnaire

The Important Other Climate Questionnaire (IOCQ) was designed to measure autonomy support from important others (Williams, G.C., et al., 2006). The IOCQ has adequate reliability, and higher perceived autonomy support has been shown to be associated with improved diabetes management and outcomes (Williams, G.C., et al., 1998; Williams, G.C., et al., 2006; Williams, G.C., et al., 2007).

Patient Health Questionnaire-9

The Patient Health Questionnaire-9 (PHQ-9) is a 9-item measure of depressive symptoms. Higher scores indicate higher depressive symptom severity. PHQ-9 cut points have been validated for classifying scores as minimal/none, mild, moderate, and severe depression. Internal reliability has been demonstrated with a Cronbach's α of 0.89 and 0.86. Test-retest reliability of the PHQ-9 is excellent (Kroenke, K., et al., 2001) and content validity of the questions is derived from the criteria for depression in the gold standard Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR).

Other Measures

In addition to these standardized scales, some additional measures were collected as follows:

A baseline HemoglobinA1c (HbA1c) value was collected at the baseline study visit. HbA1c provides a convenient method to assess average blood glucose for the preceding months. A direct relationship exists between HbA1c and mean blood glucose; therefore, a HbA1c of 6% is equivalent to an average blood glucose of 135 mg/dL (Saudek, C.D., et al., 2006). A sociodemographic survey was used to collect data for age, race, gender, and education level. A Health Conditions checklist was used to collect data on types of health conditions. Participants were asked to identify any health conditions from a list of 16 conditions aside from diabetes mellitus. Health conditions aside from diabetes mellitus were quantified using 0 = no (do not have the health condition) and 1 = yes (have the health condition). A sum score was calculated for total number of health conditions other than diabetes. Sociodemographic, HbA1c, and total number of health conditions, as well as PHQ-9 score, and were used as control variables in the multivariate linear regression analysis.

Data Management

Electronic data sharing and management was supported by the College of Nursing Technology Support Unit. The College of Nursing's 500-node wired and wireless networks are connected to the campus high-speed backbone and protected by two firewalls. Records for individual study participants are identified only by a unique study identification number that cannot be linked to any identifiers that could make a study participant individually identifiable.

Statistical Analysis

SPSS v. 19 statistical analysis software was used to analyze the data. Descriptive statistics were used to summarize the characteristics of the study sample for sociodemographic variables. Mean scores, standard deviations, and frequency statistics in the applicable contexts will be used to summarize scores on standardized measures. A bivariate correlation matrix was used to examine the adjusted correlations of the variables. A multivariate linear regression analysis was used to model the relationships among variables, using DDS as the dependent variable, and ACE and IOCQ scores as independent variables, after initially controlling for patient sociodemographic characteristics, clinical health conditions, and PHQ-9 score.

RESULTS

Sociodemographic Characteristics

As shown in **Tables 1a** and **1b**, the study participants were representative of a sociodemographically diverse population (N=45). Men represented 28.9% of the total study sample, which is a substantial proportion due to the required identification of depressive symptoms in the primary study. Participants self-identified with a diverse racial and educational background ranging from some high school education to graduate degrees. The mean age of the same was 49.1 years with an average of 2.8 health conditions in addition to diabetes mellitus. The mean hemoglobin A1c was 8.3%, which is significantly elevated from normal upper limit of

6.5% for individuals without diabetes.

Table 1b provides the average scores for the measures of interest in the study. The average score for the PHQ-9 scale was 10.7, which is interpreted as moderate depressive symptoms by the measure. The possible range of scores from 0-24 reflects the presence of no depressive symptoms to severe depression.

Bivariate Correlation Matrix

The bivariate correlation matrix was used to examine the relationships between two variables without other variables being controlled for. Multiple correlations were found to have statistical significance as illustrated in **Table 2**. The relationship value and significance are aligned with the hypotheses in **Figure 1**. The correlations between the variables support the hypotheses of the associations between IOCQ, ACE, and DDS. (1) A higher ACE score was associated with a lower perception of autonomy support ($r = -.360$, $p = .050$). (2) A higher perception of autonomy support was significantly associated with a lower perception of diabetes distress ($r = -.364$, $p = .023$). (3) Are higher ACE scores was significantly associated with a higher perception of diabetes distress ($r = .459$, $p = .006$). Also, depressive symptom scores from the PHQ-9 scale were found to have a statistically significant relationship between ACE ($r = .429$, $p = .011$) and DDS ($r = .550$, $p = .000$). The study model accounted for 48.9% of DDS.

Multivariate Linear Regression Analysis

After controlling for sociodemographic information, clinical symptoms, and PHQ-9 score, IOCQ ($p = .028$) and gender ($p = .035$) remained statistically significant in predicting DDS (**Table 3**). The male gender was coded as 0 and female gender was coded as 1. Therefore, the standardized coefficient of $\beta = -.402$ reveals that specifically the male gender is associated with greater diabetes-related distress.

DISCUSSION

Hypotheses about the direction and significance of associations between IOCQ, ACE, and DDS were supported. A substantial amount of variance was accounted for by the study model at 48.9%. This reveals that perceived autonomy support, adverse childhood experiences, and depressive symptoms play a significant role in perceived diabetes-related distress, accounting for almost half of the variance in the study model. However, the multiple linear regression analysis revealed that the IOCQ ($p = .028$) and male gender ($p = .035$) remained the only statistically significant predictors in DDS. Therefore, lower perceived autonomy support for making decisions on managing depressive symptoms and the male gender is associated with higher perceptions of diabetes-related distress, after accounting for other sociodemographic variables (age, race, gender, and education level), severity of depressive symptoms, number of health conditions, and extent of control of diabetes as indexed by baseline HbA1c level.

Important Other Climate Questionnaire

Perception of autonomy support is a modifiable risk factor that is a significant predictor of diabetes-related distress. By increasing an individual's perception of their autonomy support, the level of diabetes-related distress may potentially decrease. Also of significant interest is the finding that sociodemographic variables other than gender, depressive symptom severity, extent of diabetes control, and number of health conditions were not adequate predictors of diabetes-related distress. This reveals that individuals with diabetes are experiencing a separate burden from diabetes management separate from other health conditions, including depressive symptoms, and that the objective burden of disease (number of health conditions and extent of diabetes control) is not independently associated with diabetes-related distress.

Male Gender

The unexpected finding of the male gender being associated with a higher perception of diabetes-related distress has multiple possible explanations. Since males do not necessarily experience a higher burden than females with diabetes self-management, the higher diabetes-related distress could be attributed to cultural norms or other situational variables impacting the experience and/or reporting of distress. For example, some men may not feel that they can outwardly express their feelings in dealing with the stress identified with diabetes management. Another explanation for the association could be that men are facing greater stressors in other aspects of their life, e.g. financial, health, and employment stressors, that may lead to a greater burden of overall stress and contribute to greater stress from diabetes management.

Adverse Childhood Experiences Questionnaire

The mean score of the ACE Questionnaire was 2.2 with a range of 0 to 9 types of adverse early life events reported. Due to the increased risk of diabetes mellitus and other health conditions as the ACE score increases, it is an interesting finding that the average ACE score was relatively low, but with a substantial variability. ACE score was strongly correlated with higher diabetes-related distress ($r = .459$, $p = .006$) and lower perceived autonomy support ($r = -.360$, $p = .050$), but after controlling for multiple variables in the linear regression analysis, ACE score did not remain significant in predicting DDS. This shows that other variables that are associated with ACE score account for the significant independent variance in diabetes-related distress.

Patient Health Questionnaire-9

The wide range of PHQ-9 scores from 0-24 represents individuals experiencing no depressive symptoms to severe depression at the baseline study visit. The variance in PHQ-9 score at baseline was adequate for the regression analysis. While strongly correlated with ACE

score and diabetes-related distress, depressive symptoms became a statistically non-significant predictor of diabetes-related distress in the full regression model. This shows that, similar to ACE score, other variables that are associated with depressive symptoms account for the variance in diabetes-related distress.

Hemoglobin A1c

The study sample was sociodemographically diverse with complex clinical issues. The average hemoglobin A1c of 8.3% was well-elevated from a normal limit documenting that individuals in the study had, on average, less than optimal diabetes control. However, the range from 5-14% shows the wide variability in the sample between those with adequate and inadequate glucose control. The highest value able to be calculated by the machine used to measure hemoglobin A1c was 14%, which could mean that some study participants had a higher hemoglobin A1c than could be accurately measured. A hemoglobin A1c of 14% is equivalent to an average blood sugar of 355 mg/dL. At this high level, severe consequences from inadequate glucose management can be expected. This finding highlights the discrepancy between objective health status (extent of diabetes control) versus perceptions of diabetes-related distress.

Health Conditions Survey

The range of health conditions from 0-13 illustrates the complex array of health issues that can co-occur with diabetes mellitus. Numerous health conditions have been associated with diabetes mellitus and were listed on the measure, including depression, heart disease, kidney disease, and stroke. Health conditions, similar to other control variables, was a statistically non-significant predictor of diabetes-related distress, further illustrating the limited independent explanatory value of objective health status in prediction of diabetes-related distress.

Limitations and Future Research

There are some study limitations that may impact the generalizability. The small sample size (N=45) yielded many statistically significant findings; however, the correlational relationships should be replicated in future research with a larger sample size. Increasing the proportion of men due to the significance of the male gender in prediction diabetes-related distress would be useful in future research.

Also, the length of time that an individual has been diagnosed with and managing their diabetes may affect their diabetes-related distress. With a longer time frame to acclimate to the required lifestyle changes, individuals may have learned to cope better and experience less diabetes-related distress. Alternatively, some individuals may be persistently in diabetes-related distress even after living with diabetes for an extended period of time.

The IOCQ was used to measure autonomy support for making decisions regarding depressive symptoms in the primary study. It may not be as generalizable to overall autonomy support, or for autonomy support for managing diabetes. However, the results do show that there is a reliable association between autonomy support for managing depressive symptoms and an important diabetes-related outcome (diabetes-related distress).

Due to the literature gap in men's health, it would be interesting to have focused research to identify male interpersonal needs. Interventions for supporting effective self-management and coping with diabetes may need to be approached differently in terms of a social group setting vs. one-on-one interaction. Males may have a greater participative response to a one-on-one intervention before engaging in a support group setting. Exploration of a web-based or anonymous support group may further decrease the barriers of self-identification, time, and social stigma. Also, it would be interesting to examine if men and women respond differently to the IOCQ measure of perceived autonomy support for diabetes management.

CONCLUSION

This analysis contributes to the theoretical understanding of how adverse childhood experiences and perceived autonomy support may influence diabetes-related distress. The results can lead to informed and improved health care interventions to reduce the adverse impact of diabetes-related distress on diabetes outcomes, such as improving autonomy support and addressing adverse childhood experiences. Individuals with diabetes mellitus may experience an array of benefits from an increased perception of autonomy support from their health care providers, family members, and their social network.

Implications for Nursing Practice

By utilizing the nursing role effectively, health care providers can ensure that individuals with diabetes are being provided with adequate resources to manage their health conditions to lessen the burden of their diabetes regimen. Patient education on current diabetic management guidelines would allow the individual to understand their disease process and provide them with a greater sense of autonomy. In addition, the daily decisions surrounding lifestyle changes for diabetes management can be overwhelming. With improved strategies to identify the individual's specific needs, the individual can be guided to develop a personalized plan of care.

Empowerment training may be a valuable skill to this population to ensure that they can adequately communicate their needs to their support system. Empowerment training closely aligns with patient-centered care, since it establishes the individual as the expert of their illness. An interdisciplinary team then guides the individual to navigate the complexities of diabetes self-management with patient education and problem-solving strategies. By answering the specific concerns and questions of the individual, patient education is tailored to the individuals needs and should ultimately result in increased self-efficacy and autonomy (Anderson, R.M. & Funnell,

M.M., 2010). The empowerment technique has been shown to result in improved communication with providers, greater satisfaction of care, better metabolic and psychosocial outcomes, and emotional well-being among the diabetic population (Funnell, M.M. & Anderson, R.M., 2004).

The Diabetes Distress Scale includes the statement, “feeling that my doctor doesn’t give me clear enough direction on how to manage my diabetes”. For individuals who feel that this is a serious problem in their diabetes self-management, the nurse could teach the individual to assertively ask for clear directions by providing them with key questions to ask for their specific concerns and needs, such as a written management plan. With the implementation of empowerment training, individuals with diabetes can establish their individualized self-management plan, gain autonomy support from increased communication, and potentially lower their diabetes-related distress.

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	Frequency (N)	Percentage (%)
Gender		
Male	13	28.9
Female	32	71.1
Race		
Alaskan Native	1	2.2
Asian	2	4.4
Caucasian	26	57.8
African American/ Black	15	33.3
Other	1	2.2
Education		
Some High School	1	2.2
Completed High School	3	6.7
Some College/Technical Training	18	40.0
College Degree	13	28.9
Some Graduate/ Prof. Training	2	4.4
Graduate/Professional Degree	8	17.8

Table 1a. Sociodemographic Characteristics: Gender, Race, and Education.

	Mean	Standard Deviation	Range
Age (years)	49.1	11.27	27-69
HbA1c (%)	8.3	2.33	5-14
Health Conditions (N)	2.8	2.37	0-13
IOCQ	26.1	9.09	8-42
ACE	2.2	1.91	0-9
PHQ-9	10.7	5.68	0-24
DDS	3.1	1.05	1-5.47

Table 1b. Sociodemographic Characteristics: Age, Health Conditions, and Scores on Measures.

	PHQ-9	ACE	IOCQ	DDS	Emotional Distress	Physician Distress	Regimen Distress	Inter-personal Distress
PHQ-9	-	r= .429 p= .011*	r= -.344 p= .032*	r= .550 p= .000**	r= .594 p= .000**	r= .215 p= .155	r= .491 p= .001**	r= .352 p= .018*
ACE		-	r= -.360 p= .050	r= .459 p= .006**	r= .516 p= .002**	r= -.201 p= .256	r= .491 p= .003**	r= .537 p= .001**
IOCQ			-	r= -.364 p= .023*	r= -.235 p= .149	r= -.035 p= .834	r= -.441 p= .005**	r= -.418 p= .008**
DDS				-	r= .868 p= .000**	r= .604 p= .000**	r= .866 p= .000**	r= .730 p= .000**
Emotional Distress					-	r= .316 p= .035*	r= .715 p= .000**	r= .579 p= .000**
Physician Distress						-	r= .338 p= .023*	r= .231 p= .127
Regimen Distress							-	r= .548 p= .000**
Inter-personal Distress								-

Table 2. Bivariate Correlation Matrix. * signifies $p < .05$, **signifies $p < .01$

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	
5	(Constant)	2.233	1.002		2.229
	Age	.009	.013	.103	.670
	Race	-.100	.124	-.127	-.799
	Sex	-.818	.361	-.402	-2.267
	Education Level	.089	.113	.123	.788
	Total N Health Conditions	.071	.055	.196	1.286
	HCA1C	.146	.081	.370	1.800
	PHQ9_TOTAL_SCORE	.045	.029	.280	1.579
	ACE_TOTAL_SCORE	-.031	.099	-.065	-.316
	IOCQ Total Score	-.043	.018	-.440	-2.365

a. Dependent Variable: NEW DDS overall mean score

Table 3. Linear Regression Analysis.

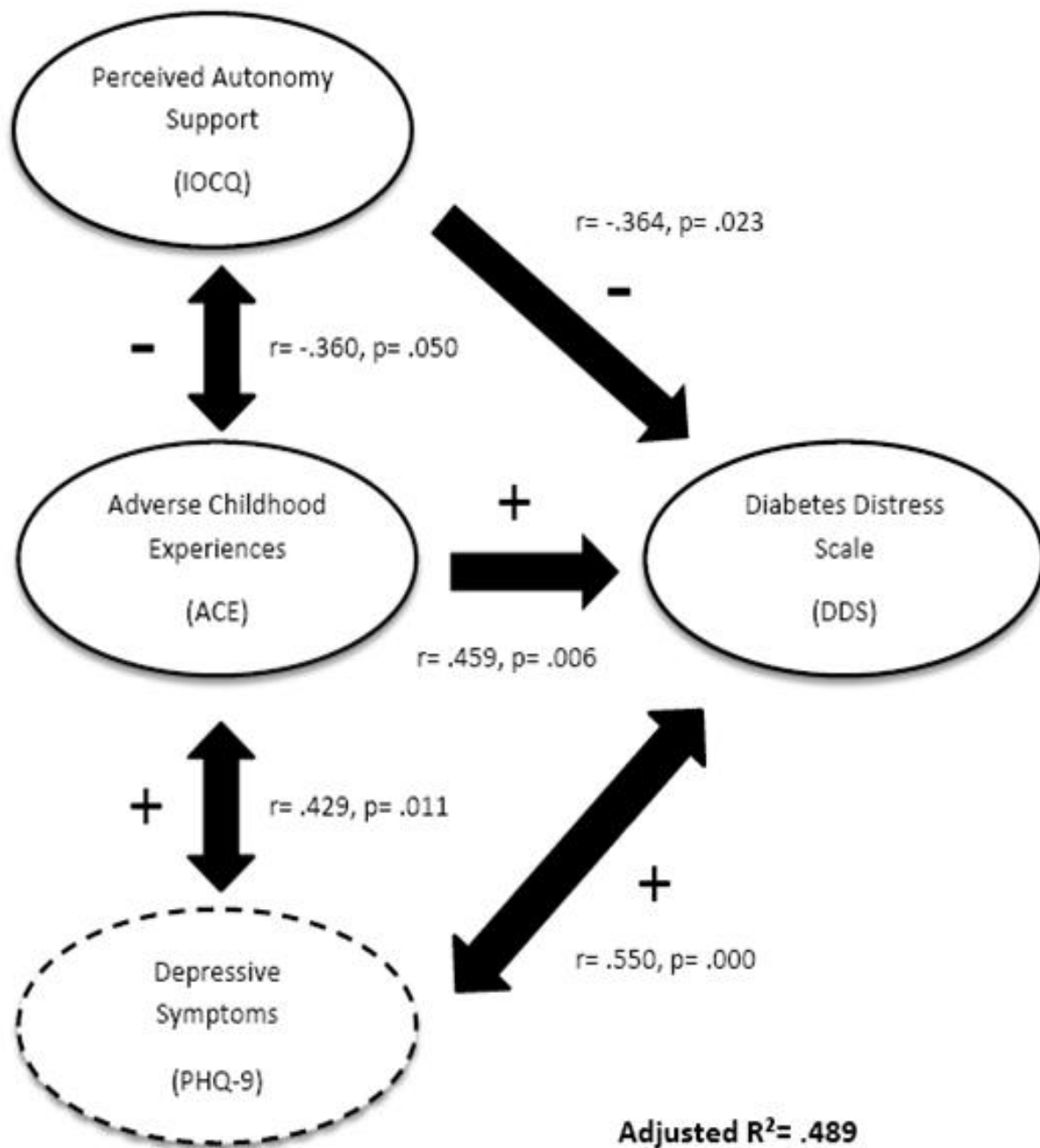


Figure 1. Hypotheses Model with Results. Hypotheses for Association indicated by “+” and “-”.